



### **ABSTRACT OF THE DISCLOSURE**

Methods for producing by electrochemical reduction a carbon-containing material with its surface modified by organic groups, in particular functionalized organic groups. Certain embodiments of the methods include contacting the carbon-containing material with an organic diazonium salt in solvent, optionally in the presence of an electrolyte and negatively polarizing the carbon-containing material relative to an anode also in contact with an electrolytic solution separate from said diazonium salt solution, wherein the electrochemical reduction is carried out on an organic diazonium salt in protic solvent in an acid medium. Carbon-containing materials with a surface modified by organic groups and the use of these modified materials, for example for producing composite materials or for fixing molecules of biological interest, are taught.

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